INTEX-17 flight summary- 7 August, 2004

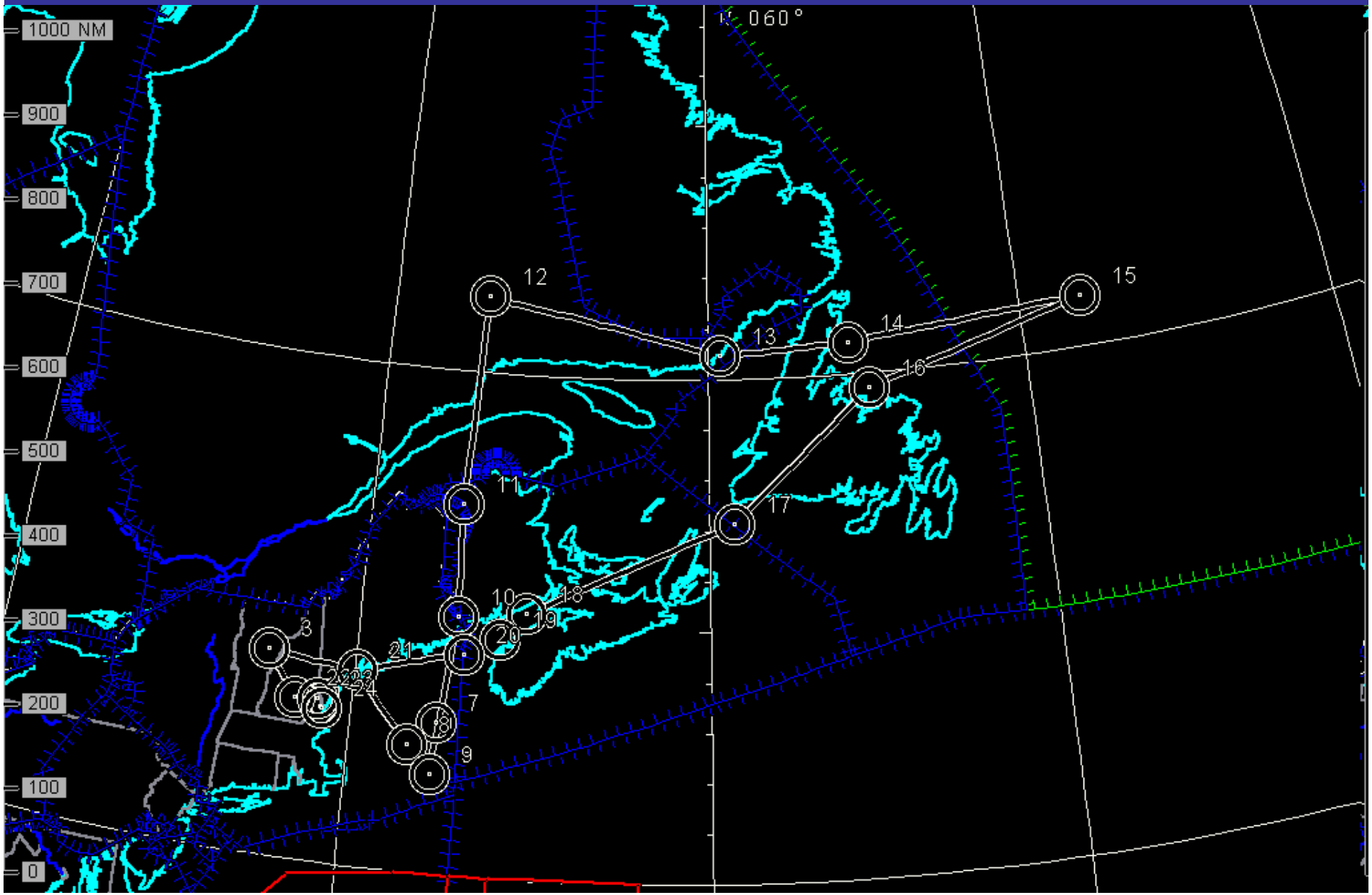
Flight 17 was the ninth and last DC-8 science flight from Pease. The main objectives were to under-fly Terra (MOPITT/MISR) and perform a predefined "L" maneuver in coordination with the J-31, Ron Brown and MISR, sample North American outflow, a stratospheric intrusion, and perform P-3 intercomparison. Takeoff time was 1400 UT with a total flight duration of 8.5 hours. The flight plan and flight profile is shown in the attached slides.

Meteorological conditions during Pease Local Flight 9 were similar to those of the previous day (Pease Local 8). A frontal system extended off the Atlantic Coast; however, a weak low pressure center that was riding up the front was causing more widespread cloudiness and precipitation than on the previous day. High pressure continued to dominate the Midwest. Low and middle clouds were absent over a relatively large area of the general MISR region, but cirrus were absent in a much smaller region—the region actually flown for the underpass. Thus, optimum conditions occurred. A deep closed low was located east of the surface front throughout the middle and upper troposphere. The troposphere was relatively low in this area, and jet level winds east of the low were strong (reaching ~ 120 kt). The westward stacking of the low produced strong directional wind shear in the MISR region. Jet level winds were from the south (in advance of the trough), but were from the northwest near the surface (behind the surface front). Weather conditions over the northeastern portion of the flight were dominated by clouds and widespread precipitation—due to the surface low and trough mentioned above. This in-flight precipitation was more widespread than during any previous flight. Conditions improved during the return leg, and the P-3 inter-comparison region was virtually cloud free.

At the start we headed east to coordinate a "closure" and satellite validation experiment that involved timed overpass of the MISR-MOPITT/Terra satellite with coordinated DC-8 and J-31 spirals with Ron Brown underneath. We were fortunate to get cloud free conditions during this detailed "L" profile. This entire mini-experiment took 2.5 hours and was successfully executed for the very first time. The purpose is to relate DC-8 aerosol chemical and microphysical measurements with several remotely measured parameters (e. g. AOD). The predicted stratospheric influences were widespread at 31 Kft with O3 levels exceeding 300 ppb. Heading north we sampled both the surface air and profiled across the troposphere to see if any Asian or biomass burning influences could be found. Surface conditions were much less polluted than forecasted with minimal indications of any outflow. The entire northern leg was extremely cloudy resulting in flight restrictions. The air here was generally quite clean and well mixed. The north-eastern track was cut short to meet P-3 at the rendezvous point at 19:30 UT. Along this track some pollution layers were sampled between 22-26 K ft that contained O3 in excess of 90 ppb were also very dry suggesting some stratospheric influences. The DC-8/P-3 intercomparison took place as planned at 12 Kft and 1 Kft and lasted about 45 minutes in duration. The DC-8 returned to Pease after this intercomparison. All major mission objectives were met with pollution outflows much weaker than forecasted.

The navigational data are available at URL: http://www.dfrc.nasa.gov/Research/AirSci/DC-8/ICATS/index.html

INTEX-NASA 817 7 Aug 04



DC-8 NASA 817 INTEX 07 Aug 04

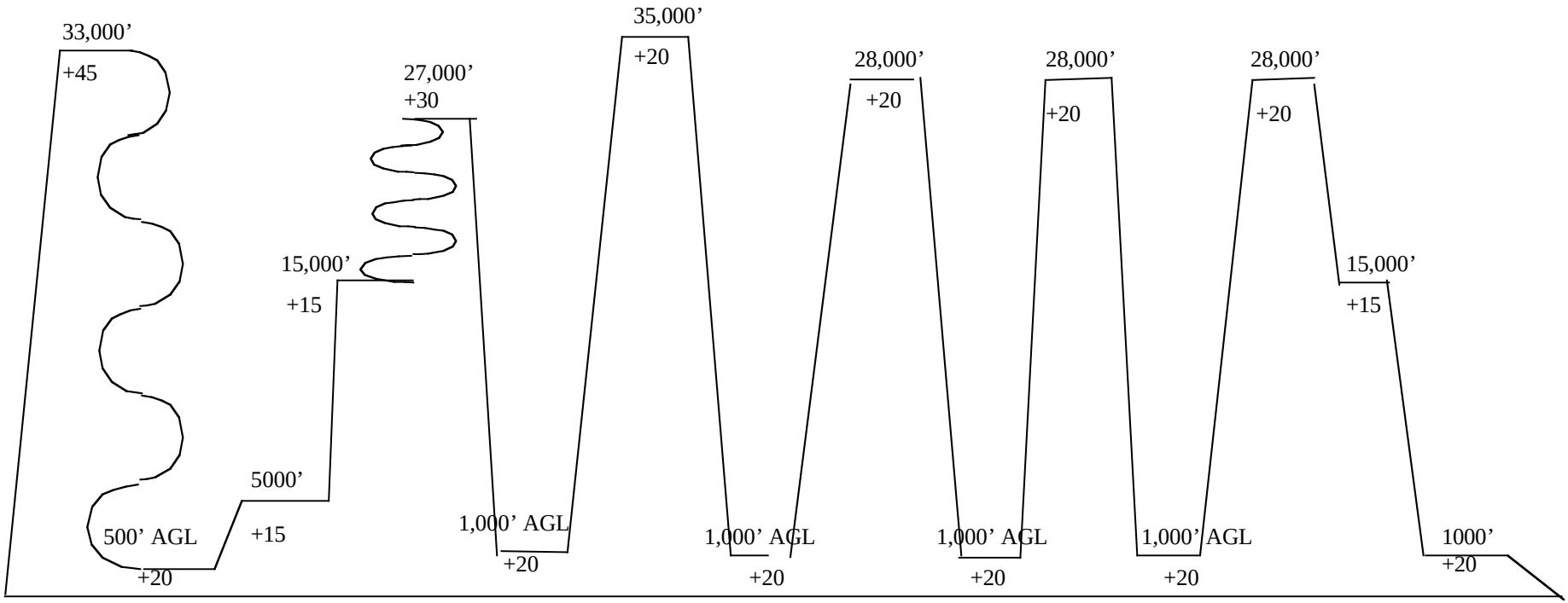
SPIRAL CLIMBS

to 10,000 msl @1,000 fpm

then 1500 fpm

ALL ENROUTE CLIMBS/DESCENTS

1500 FPM



PSM 42N 6742W YHR DOTTY 51N48W CYMON BRIDG CAAPE PSM

TYPE ACFT	CALL SIGN	DATE	FROM	TO	PLND TO	ACT TO	PILOT	COPILOT
DC-8	NASA817		PEASE INTL TR N 43 05.5 W070 50.0	PEASE INTL TR N 43 04.7 W070 49.4	14:10			
TOT DIST	TOT TIME	FUEL REQ					NAVIGATOR	ENGINEER
2939.2	08+54	91732						

TP DTD#	Fix/Point Description	FREQ	Latitude Longitude	Alt Wind	TAS GS	TC MC	LEG DIST DIST REM	LEG TIME TIME REM	ETA	RETA	ATA	REMARKS
1	KPSM 16/RW PEASE INTL TR		N 43 05.5 W070 50.0	94M		149 165	0.0 2939	00+00 08+54	14:10			
2	CON/R CONCORD	076X 112.90	N 43 13.2 W071 34.5	12255M	N/A N/A	283 299	33.5 2906	00+06 08+48	14:16			
3	MPV/E MONTPELIER	045X 110.80	N 44 05.1 W072 27.0	20000M	330 330	324 339	64.4 2841	00+12 08+37	14:28			
4	NHZ/T BRUNSWICK	099X	N 43 54.1 W069 56.7	20000M	330 330	096 112	109.0 2732	00+20 08+17	14:48			
5	.SHIP RON BROWN	099X	N 42 33.0 W068 23.0	20000M	330 330	140 157	106.2 2626	00+19 07+57	15:07			
6	.INITIAL PT none	099X	N 42 00.0 W067 42.0	20000M	330 330	137 154	44.9 2581	00+08 07+49	15:15			
7	.RUN-IN PT none	099X	N 43 02.0 W067 37.0	20000M	330 330	003 021	62.1 2519	00+11 07+38	15:26			
8	.SHIP RON BROWN	099X	N 42 33.0 W068 23.0	20000M	330 330	229 247	44.6 2475	00+08 07+30	15:34			
9	.INITIAL PT none	099X	N 42 00.0 W067 42.0	20000M	330 330	137 154	44.9 2430	00+08 07+22	15:43			
10	YSJ59/W YSJ/E277059	082X 113.50	N 45 09.7 W067 13.2	20000M	330 330	006 024	190.8 2239	00+35 06+47	16:17			
11	TAFFY/W TAFFY		N 47 22.4 W067 18.2	20000M	330 330	358 017	132.8 2106	00+24 06+23	16:41			
12	VOKET/W VOKET		N 51 30.0 W067 00.0	20000M	330 330	003 023	248.1 1858	00+45 05+38	17:27			
13	YHR/N CHEVERY	276.00	N 50 27.9 W059 38.1	20000M	330 330	103 125	286.0 1572	00+52 04+46	18:19			
14	DOTTY/W DOTTY(YAY 182		N 50 38.0 W055 35.0	20000M	330 330	086 109	155.3 1417	00+28 04+18	18:47			

TP	Fix/Point	FREQ	Latitude	Alt	TAS	TC	LEG DIST	LEG TIME	ETA	RETA	ATA	REMARKS

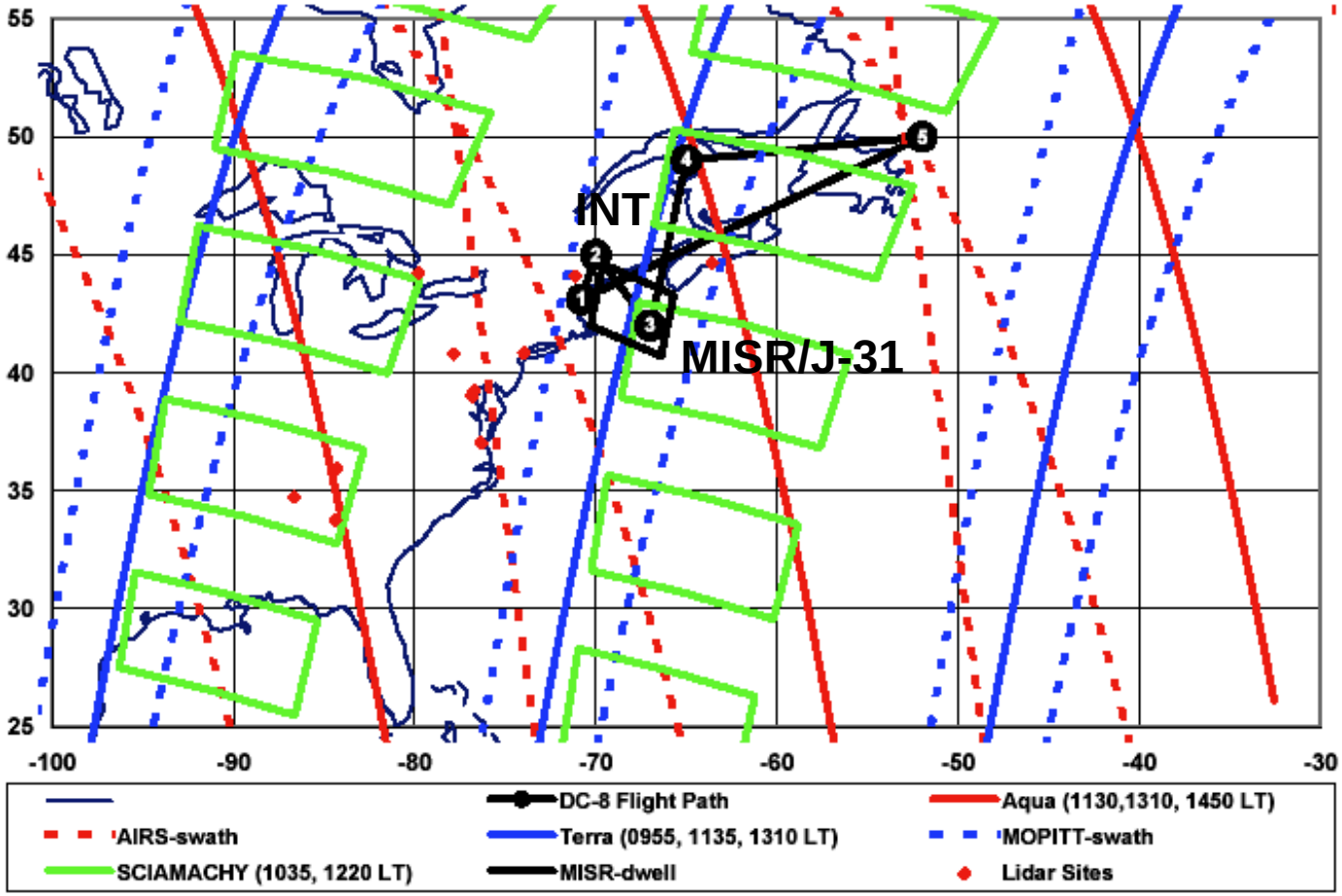
DTG#	Description		Longitude	Wind	GS	MC	DIST REM	TIME REM				
15			N 51 00.0 W048 00.0	20000M	330 330	086 108	289.3 1127	00+53 03+25	19:39			
16	CYMON/W CYMON		N 49 43.0 W055 00.0	20000M	330 330	254 276	279.7 848	00+51 02+34	20:30			
17	BRIDG/W BRIDG		N 47 08.8 W059 16.3	20000M	330 330	228 249	230.0 618	00+42 01+52	21:12			
18	CAAPE/W CAAPE		N 45 18.0 W065 17.8	20000M	330 330	246 266	274.3 343	00+50 01+02	22:02			
19	.P-3 RDZ none		N 44 45.0 W066 00.0	20000M	330 330	222 241	44.6 299	00+08 +54	22:10			
20	ALLEX/W ALLEX		N 44 25.0 W067 00.0	20000M	330 330	245 263	47.3 252	00+09 +46	22:19			
21	NHZ/T BRUNSWICK	099X	N 43 54.1 W069 56.7	20000M	330 330	256 274	130.9 121	00+24 +22	22:42			
22	CON/R CONCORD	076X 112.90	N 43 13.2 W071 34.5	20000M	330 330	240 256	82.1 39	00+15 +07	22:57			
23	EPDEY/W EPDEY		N 43 14.5 W070 57.5	20000M	330 330	087 103	27.1 11	00+05 +02	23:02			
24	KPSM/A PEASE INTL TR		N 43 04.7 W070 49.4	20000M	330 330	149 165	11.5 0	00+02 +00	23:04			

INTEX-17 Flight plan- August 7, 2004

Take off: 1015 LT

8.5 hours

Point	Latitude	Longitude	Special instructions
1	43.1	-70.8	Estimated takeoff 10:15
2	45	-70	
3	42	-67	MISR validation
4	49	-65	
5	50	-52	
6	43.1	-70.8	



- **DC-8/RB/J-31/MISR validation (2.5 h)**
- **Terra validation**
- **DC-8/P-3 inter-comparison**
- **North American outflow/aging**